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Mars Observer

Nation: U.S. (65)
Objective(s): Mars orbit
Spacecraft: Mars Observer
Spacecraft Mass: 2,573 kg
Mission Design and Management: NASA JPL
Launch Vehicle: Titan III (CT-4)
Launch Date and Time: 25 September 1992 / 17:05:01 UT
Launch Site: ESMC / launch complex 40
Scientific Instruments:

1) imaging system
2) thermal emission spectrometer
3) pressure modulator infrared radiometer
4) laser altimeter
5) magnetometer/electron reflectometer
6) gamma-ray spectrometer
7) radio science experiment
8) Mars balloon relay receiver

Results: Mars Observer was designed to carry out a high-resolution photography mission of the Red Planet over the course of a Martian year (687 days) from a 378 x 350-kilometer polar orbit. It carried a suite of instruments to investigate Martian geology, atmosphere, and climate in order to fill in gaps in our knowledge of planetary evolution. A mere 31 minutes after launch, the new Transfer Orbit Stage (TOS) fired to boost the spacecraft on an encounter trajectory with Mars. After a 725-million-kilometer voyage lasting eleven months, just two days prior to planned entry into Mars orbit, the spacecraft suddenly fell silent at 01:00 UT on 22 August 1993. Despite vigorous efforts to regain contact, Mars Observer remained quiet. When the spacecraft did not reestablish command as a result of a stored program that was designed to do so in case of five days of silence, mission planners finally gave up hope on salvaging the mission. The results of a five-month investigation proved to be inconclusive, but one likely cause of the catastrophic failure may have been a fuel line rupture that could have damaged the spacecraft's electronics, throwing the vehicle into a spin.

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